DEPARTMENT OF THE NAVY
NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

IN REPLY REFER TO

5090
Ser 2319/1823/DEC

DEC 01 1994

Mr. Andrew Miniuks
Remedial Project Manager, Region I
U.S. Environmental Protection Agency
JFK Federal Building
Boston, MA 02203-2211

Re: NAVY'S RESPONSES TO EPA COMMENTS ON THE DRAFT FINAL PHASE II REMEDIAL INVESTIGATION REPORT FOR SITE 09 - OLD FIRE FIGHTING TRAINING AREA, VOLUMES I AND II AT NETC NEWPORT

Dear Mr. Miniuks:

Attached you will find the Navy's responses to EPA's comments on the Draft Final Phase II RI Report for the Old Fire Fighting Training Area. The Navy's responses follow the attachment structure submitted with your letter facsimile transmitted on September 13, 1994 however dated August 13, 1994.

After reviewing Section 7.2 of the Federal Facilities Agreement (FFA), it is not clear what the next step of the process is since EPA nor RIDEM issued a Letter of Concurrence or invoked Formal Dispute Resolution as it pertains to the subject document. The Navy, therefore, is submitting written responses to comments on the draft final Phase II RI report for resolution under the informal dispute process. The Navy requests the attached responses be reviewed and evaluated for acceptance by December 30, 1994. If the attached responses are acceptable, the Navy requests a letter of concurrence on the portions of the document not relating to the ecological risk assessment. If EPA contemplates that further discussions are warranted to satisfactorily resolve the remaining issues, the Navy is requesting these discussions be conducted by a conference call or meeting at your earliest convenience. Upon final acceptance of the Navy's responses, the portions of the document not relating to the ecological risk assessment will be amended and submitted 30 days there after.

I would also like to address a number of issues that were stated in you cover letter as they relate to the draft final Phase II RI report for the Old Fire Fighting Training Area. These issues are as follows:

o Based on the available toxicity information, ecological risks were evaluated for Polynuclear Aromatic Hydrocarbons (PAHs) in Section 7 of the Ecological Risk Assessment Report. The findings of this assessment will be added to the Executive Summary of the Final Phase II RI report and Ecological Risk Assessment Report as follows; "This assessment indicated that PAHs are unlikely to pose a risk to terrestrial organisms. However, PAH levels detected in near-shore sediments may pose a slight risk to benthic invertebrates according to derived sediment quality criteria. Several sediment PAH levels also exceeded established NOAA effects range values indicating a potential risk to benthic invertebrates at shoreline and near-shore stations."

o As stated in the draft final Phase II RI report, it is the Navy's position that potential (not primary) sources of the pyrogenic PAHs detected in sediments at the site may be attributable to past site activities, asphalt debris strewn along the site's shoreline, atmospheric deposition, nearby sewage effluent, combined sewer overflow discharges, and/or urban runoff. The Navy does acknowledge that previous site operations may have contributed to shoreline and near-shore contamination however available site data (petrogenic PAHs versus pyrogenic PAHs) does not indicate that the old fire fighting training operations are a dominant source of the observed contamination. The attached Navy's response to EPA comment #1 provides further justification.

o The third issue pertains to finalization of the Phase II Remedial Investigation Report and how it relates to the ongoing sediment and biota investigations. Finalization of the Phase II RI report, as it pertained to the approved Phase II RI work plan requirements, was scheduled for completion October 1994. Based on EPA's letter dated August 13, 1994 (facsimile transmitted September 13, 1994) and the requirement for the Phase II ecological risk assessment, completion of the Phase II RI report by October 1994 was not feasible. A review of the alternatives available to complete the Phase II RI included:

(1) Finalization of the Phase II RI Report including the Phase I ecological risk assessment in January 1995 per the FFA schedule and the Phase II RI work plan requirements. The Phase II Ecological Risk Assessment would then be submitted as a modification to the Final Phase II RI Report pursuant to Section 7.9 (a) and (b) of the FFA. The Feasibility Study phase of the project would be initiated upon completion of the Final Phase II RI Report and Phase I Ecological Risk Assessment.

(2) Finalization of the Phase II RI Report would be postponed until the results of the Phase II Ecological Risk Assessment are presented and approved. The Feasibility Study phase of the project would be initiated upon completion of the Final Phase II RI Report and Phase II Ecological Risk Assessment.

As agreed upon by all parties during the Remedial Project Manager's meeting on November 7, 1994, finalization and approval of the Phase II RI report will not take place until completion of the Phase II ecological risk assessment as proposed under Alternative 2. Enclosure (1) is submitted to finalize the plan of action and milestone schedule and to illustrate how all the components are to be integrated.

If there are any questions regarding the attached responses or proposed schedules, please contact me at (610) 595-0567 ext 147.

Sincerely,

Deborah Carlson

D. E. CARLSON
Remedial Project Manager
By direction of the Commanding Officer

Copy to:
RIDEM, Paul Kulpa
NETC Newport, Brad Wheeler
TRC-EC, Bob Smith

NAVY RESPONSES TO EPA COMMENTS ON
NAVY COMMENT RESPONSES ON THE
DRAFT FINAL REMEDIAL INVESTIGATION REPORT
OLD FIRE FIGHTING TRAINING AREA
NAVAL EDUCATION TRAINING CENTER
NEWPORT, RHODE ISLAND

General Comments

1. The Navy continues to make unsubstantiated statements that the sources of polynuclear aromatic hydrocarbons (PAHs) within the near-shore sediments are due to "atmospheric deposition, sewage effluent, or combined sewer overflow discharges, and/or urban runoff are potential sources of the PAHs detected at the site."

While it is possible that these sources have contributed to the PAH contamination within the near-shore sediments, it is also likely that the Navy's previous fire fighting activities at this site have also contributed to the contamination detected within the sediments. This likely possibility is not mentioned within this report.

The Navy has not presented adequate information to preclude the Old Fire Fighting Training Area as the dominant source of contaminants detected within the on-shore and off-shore marine environment.

Response: The report does note that past site activities may have also contributed to the noted sediment contamination. As presented on page ES-19 of the report, "The source of the PAH contamination in the near shore samples may be attributed to previous site activities, the asphalt debris which is strewn along the site's shoreline, atmospheric deposition, nearby sewage effluent, combined sewer overflow discharges, and/or urban runoff.". The possibility that the previous site operations contributed to the contamination is again recognized on page 4-32 of the RI report where it is stated that "...past fire fighting training activities at this site may have contributed to the elevated PAH,...". Furthermore, as stated on page 4-32, it is also recognized by the Navy that "...the relative proportions of the sources cannot be determined with the available data.". To further recognize this concern, pages ES-16, ES-19, and the last sentence of the contamination assessment summary on page 5-9 of the report will be revised in the final RI report to include "past site activities" as a potential source of the PAH contamination.

In addition, as is presented in the report, PAH fingerprint analysis indicates that although some petrogenic PAHs (primarily petroleum product originating) were detected in the site sediments, the sediment PAH contamination is primarily pyrogenic in nature (i.e., combustion and/or creosote/coal-tar originating PAH). In addition, the sediment and bivalve PAH diagnostic ratio plots presented and discussed in the report

indicate that the site data primarily clusters in an area of the plots which is highly characteristic of combustion products or creosote/coal tar and which is indicative of the samples being exposed to a PAH composition that is common to Narragansett Bay, and most coastal areas. Thus, while the Navy does acknowledge that previous site operations may have contributed to the shoreline and near-shore contamination, the available site data does <u>not</u> indicate that the fire training operations are a "dominant source" of the observed contamination.

2. Despite detecting inorganic contamination within the groundwater and soil, the Navy has not presented an explanation for the contamination. The conceptual model for this site does not account for the contamination detected during the field work.

Describe the Navy's conceptual model for this site to incorporate the results of the field work.

<u>Response</u>: *As with the organic compounds, the inorganic analytes detected in the soil and ground water at the site are discussed throughout Section 4.0 of the report. In instances where the potential source of the inorganic contamination is evident, they are discussed (e.g., visible petroleum contamination). The inorganic contamination assessment also includes numerous discussions and comparisons of the site data to off-site background soil and ground water inorganic levels. For inorganics in ground water, this assessment also includes a discussion of the likely influence of salt water intrusion at the site. Although it appears that past site or area activities account for some of the inorganic levels detected at the site, other potential sources or explanations for the inorganics than those already presented in the RI report and again below in response to comment #3 are not evident at this time.*

3. Although the draft final Phase II RI report states that high turbidity levels were noted in the groundwater samples and these suspended solids may be the cause of the elevated inorganics detected within the samples, no resolution or possible explanation of this issue is noted in the report. The report also states that elevated levels of inorganics were detected within background samples, yet no further explanation is provided.

Describe how past activities at the site (e.g., burning of waste oils, etc.) relates to the inorganic contamination which has been detected within the groundwater.

Provide documentation to support the Navy's belief that some of the inorganic contaminants detected within the groundwater is due to naturally occurring background conditions.

<u>Response</u>: *The draft final RI report presents a discussion of the turbid ground water conditions at the site and its effects on the inorganics ground water data in Section 4.2.4 of the report. This issue is discussed by presenting the ground water turbidity*

data along with a comparison of filtered and unfiltered ground water data. The apparent source of the highly turbid area ground water is the high fines (silts and clays) content of the shallow unconsolidated and consolidated geologic materials in the area. This finding is supported by soil grain size data (see Section 2.6.1 of the report) and the filtered ground water data (see Table 4-16). The grain size data indicates that a high percentage (approximately 23%) of silts and clays are present in the formation material supporting the likelihood of the presence of turbid ground water in the area. Whereas, the filtered ground water data indicates significant metals concentrations reductions (up to over 450 times) in the filtered ground water samples which is also indicative of metals-laden sediments in the area ground water. This finding will be reiterated in Section 4.2.4 of the final RI report.

Documentation to support the Navy's position that some of the inorganics detected in the site ground water are due to naturally-occurring background conditions is presented throughout the draft final RI report. More specifically, the presence of elevated levels of inorganics in the off-site background ground water wells is discussed in Section 4.2.4 of the draft final RI report. As discussed in this section, the Site 09 background ground water data indicates the presence of elevated levels (above MCLs and SMCLs) of aluminum, iron, manganese, beryllium, lead, chromium, and nickel. The findings of ground water investigations at other NETC sites also indicates that the background ground water in the area typically has a high aluminum, iron, and manganese content. In addition, as documented in this report and other reports (TRC, 1992-Phase I RI Report and TRC, 1994 McAllister Point Landfill RI Report), background area soils have been shown to have high concentrations of these and several other naturally-occurring minerals. Thus, as presented above, the highly turbid site ground water samples (i.e., high suspended solids content) would also contain these minerals. Furthermore, the presence of naturally-occurring elevated levels of iron and manganese in State of Rhode Island ground water is documented (USGS, 1991, Ground Water Resources of Rhode Island). This USGS document (page 69) also reports that trace concentrations (defined as less than 1 milligram per liter) of metals including barium, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc have been detected in Rhode Island's ground water. In addition to aluminum, iron, and manganese, all of the metals detected at elevated levels (above MCLs) in the Site 09 background ground water have also been detected at elevated levels above MCLs in off-site background ground water at several other NETC sites (TRC, 1992 and TRC, 1994). Elevated levels of several inorganics (calcium, potassium, magnesium, and sodium) have also been shown to be related to the effects of salt water intrusion at Site 09. In addition, the absence of any organics in the background ground water samples further indicates that there is no apparent source of upgradient anthropogenic ground water contamination which may be related to the elevated inorganic levels. Thus, based on the available data and information, it is the Navy's position that some of the inorganic levels detected in the site ground water are due to the naturally-occurring presence of these minerals in area soils, surface water, and ground water. This position will be reiterated by presenting the

above summary discussion and references at the end of Section 4.2.4 of the final RI report. In addition, the above-referenced information obtained from the USGS report on regional ground water quality will be documented in Section 3.3.7 of the final RI report.

As is reported in Section 1.3.2 of the RI report, oils were reportedly burned at the site during previous fire fighting training exercises. Given that oils are known to contain metals (in addition to organic compounds) and any spills or residues associated with the burning of any oils would contain metals, it is possible that the metals detected at the site are related to these prior site activities. In addition, as stated on page 4-18 of the report, several soil samples which were shown to have the greatest overall level of metals contamination were those which were noted to have petroleum staining and odors. As shown on Table 4-4A of the report, numerous metals were also detected in the oily sludge sample collected from an abandoned subsurface pipe discovered at the site. Furthermore, the results of the soil and ground water sample organics analysis indicates the effects of petroleum-related contamination at the site. Thus, as stated in the report conclusions in Section 5.2, past activities at the site have impacted some of the site soils and ground water. However, some of the highest levels of metals were also detected in other areas of the site and off of the site which did not show any other signs of potential contamination. Therefore, as discussed above, given the documented background and regional presence of inorganics, the contribution of the prior site activities to the inorganics detected at the site cannot be definitively differentiated across the site at this time.

Specific Comments

The following comments are based on new information provided in the Draft Final RI Report:

Section 1.3.3 - Previous Site Investigation, page 1-14

4. Revise the text to state:
- soil gas survey results are provided in Appendix D-1, not Appendix C;
- the Phase I RI Magnetic contour map is provided in Appendix C-2, not Appendix B; and
- the Phase I RI conductivity contour map is provided in Appendix C-3, not Appendix B.

Response: The noted corrections will be made to the text of the final RI report.

Section 2.2 - Geophysical Investigation, pages 2-2, 2-3

5. Revise the text to state that Appendix B does not provide the results of the Phase II electromagnetic and magnetometer surveys, these results are presented in figures

2-4 and 2-5; that the Hager-Richter report is provided in Appendix C-1, not Appendix B.

Response: This statement will be corrected in the final RI report.

Section 2.2.2 Electromagnetic Conductivity Survey, page 2-5

6.The text states that elevated values (over 300 mmhos/m) were recorded west of the central mound area; however, contours drawn on Figure 2-4 do not show any readings in this area greater than 100 mmhos/m.

Revise either the text or the figure.

Response: The referenced statement was in error and will be corrected to read "Along the western side... (up to 100 mmhos/m)..." in the final RI report.

Section 2.3.2 Soil Gas Results, page 2-9

7. Revise the text to state that soil gas survey results are presented in Appendix D, not Appendix C.

Response: The noted correction will made to the text of the final RI report.

Section 2.5.2.2 Field Measurements and Observations, pg 2-16

8.Revise the text to state: - the Phase II soil borings logs/well boring logs are found in Appendices F-1 and F-2, not appendices E and F; - the soil boring logs/well boring logs are found in Appendices E-1 and E-2, not appendix D.

Response: The noted corrections will be made to the text of the final RI report.

Section 2.6.1 Overview of Investigation, page 2-20

9. Revise the text to state that results of grain size analysis are in Appendix G, not Appendix H.

Response: The noted correction will made to the text of the final RI report.

Section 2.6.2 Field Measurements and Observations, page 2-23

10. Salinity values in this section and on Table 2-6 are reported in parts per hundred (%); a more common way of reporting salinity is parts per thousand (ppt). Ocean salinities generally run from 33-37 ppt; if the values in the report are to be left in parts

per hundred, a statement of general ocean values, in parts per hundred (3.3-3.7%) would be helpful here, to keep the reader from misinterpreting 1.39% as 1.39 ppt. The correct conversion is 13.9 ppt, a value about midway between the value of fresh water and ocean water.

Response: As requested, the salinity units of parts per thousand (ppt) will be reported for the salinity data in the final RI report. In addition, for informational and comparison purposes, the salinity value of 24 ppt measured in the bay adjacent to the site during the ground water sampling will be provided in the final RI report.

Section 3.3.6 Site Ground Water Hydrogeology, page 3-22

11.
i) Revise the text to state MW-8R, MW-9R and MW-IIR (not MW6R) are on site.
ii) Revise the text to discuss comparison of two rising head tests performed on MW-9R.

Response: The noted correction to the first sentence of the second paragraph of page 3-22 will be made to the text of the final RI report. In addition, the following statement will be added to the second paragraph of page 3-22 regarding the two slug test results for well MW-9R. "The differences in the results of the slug tests performed on well MW-9R are likely due to very slight differences in the starting of the test (i.e., data logger) upon the withdrawal of the slug from the well and the resultant effects on recording the time sensitive early response of the tests." In addition, the following will be noted in the final report "However, note that the results of these tests are primarily used to estimate ground water flow rates which are generally considered accurate within one to two orders of magnitude."

Section 3.3.6 Site Ground Water Hydrogeology (Vertical Hydraulic Gradients), page 3-23

12.While it may be true that precipitation is higher in the winter months, a more important factor in determining the change from negative to positive gradient at the MW-6 well cluster may be net recharge. During winter months evapotranspiration would be low, allowing more of the precipitation to recharge into the ground. Revise the text to discuss this issue.

Revise the text giving the range of vertical gradients at the MW-11 well cluster to include new value for 5/21/94.

Response: The potential effects of evapotranspiration on ground water recharge will also be recognized by rewording the referenced statements as follows: "As documented by the tidal study and water level measurements, there is little to no tidal influence at well MW-6, thus the observed changes in the vertical gradients are most

likely due to the seasonal local ground water recharge influences (i.e., precipitation, evapotranspiration). This is supported by the fact that at the off-site well MW-6, a slight negative or downward gradient was measured in the periods of greatest precipitation and lowest evapotranspiration (January and February) and a slight positive or zero gradient was measured in the transitional or drier months and periods of higher evapotranspiration (May and July)."

The text already provides the range of vertical gradients at the well MW-11 cluster to include the value of for 5/12/94. To clarify the text in response to this comment, the gradient ranges will be presented from low to high (e.g., -0.0451 ft/ft to 0.0289 ft/ft at MW-11).

Section 3.3.6 Site Ground Water Hydrology (Horizontal Hydraulic Gradients), page 3-24

13. Revise the text to state that the slightly lower horizontal gradient determined for the western portion of the site is probably due to the fact that no well measurement at MW-7S was made on 2/22/94, the date that the highest horizontal gradient was determined for both the central and eastern portions of the site. As currently written, the text implies the difference may be due for some other reason (e.g., change in geology, etc.). Revise the text accordingly.

Response: As shown in Table 3-5, slightly lower horizontal gradients were consistently measured across the western portion of the site. Although no well measurement was obtained from well MW-7S on 2/22/94, the absence of this value does not provide an explanation for the lower horizontal gradients measured in this area of the site on all other measurement dates. In addition, although the highest horizontal gradients were measured in other portions of the site on 2/22/94, the temporal variations measured in the gradients in each area of the site were so minimal (thousands of a foot) that it is very likely that the lowest horizontal gradient once again existed in the western site area on 2/22/94. Thus, the Navy does not believe that the report text should be modified in response to this comment.

Table 3-4

14.
i) Revise text to state the method of calculating the vertical hydraulic gradient is explained in Appendix I-4, not Appendix J.

ii) There is a mathematical error in computing the vertical distance and the head difference for MW-11 on 5/12/94; as a result, the correct gradient appears to be 0.0292, not 0.0289.

Revise the text.

Response:
i) The text of the report will be revised to correctly reference Appendix I-4.
ii) The entries in Table 3-4 for well nest MW-11 are in error. The correct entries are as follows: vertical distance = 14.38 feet, head difference = 0.33 feet, and vertical gradient = 0.0229 ft./ft.. These corrections will be made to the final RI report.

Response to Comments

The following responses to EPA comments do not appear to have been incorporated and/or require additional documentation as noted below. The response number is the number associated with the original EPA comment; see EPA's letter dated May 13, 1994:

12.The reference to the 12-pound hammer is still present on p. 3 of Hager-Richter's report in Appendix C-1, and has not been deleted as stated in the Navy's response.

Resolve this discrepancy.

Response: The corrected page of the Hager-Richter report will be inserted in the final RI report.

13. A figure was added showing the contouring performed under the EM-31 Survey, however, no additional discussion was provided in the text.

Add discussion of the EM-31 survey to the text as noted in the original response.

Response: As stated in the original comment response, the results of the Phase II EM survey were presented in the draft final RI report. As requested, these results have been presented on a contour map on Figure 2-4 of the report. In addition, the EM results are discussed in the text on page 2-5 of the RI report. However, in response to this comment the discussion on page 2-5 will be expanded in the final RI report to further reflect the EM results presented on Figure 2-4.

14.See comment 13.

Response: As stated in the original comment response, the results of the Phase II magnetometer survey were presented in the draft final RI report. As requested, these results have been presented on a contour map on Figure 2-5 of the report. In addition, the EM results are discussed in the text on page 2-6 to 2-7 of the RI report. However, in response to this comment the discussion on pages 2-6 to 2-7 will be expanded in the final RI report to further reflect the magnetometer results presented on Figure 2-5.

17. It is not possible to get a quantitative feel for which of the well clusters (MW-2 or MW-11) is closer to the shore from the provided text or figures. If the Navy has quantitative information available about which well is actually closer to the shoreline, then revise the text of the RI report, especially if it is to be used as a possible explanation of the observed differences in the vertical gradients.

It is unclear what is meant by the Navy's other explanation that "MW-2 is located 200 feet east of MW-11 in along Coasters Harbor..."; identify how this will effect the tidal influence on the well cluster.

Furthermore, clearly describe the significance of the vertical gradient at this site. If, as the Navy appears to claim, the reversal of vertical gradient at MW-11 is solely due to tidal influences (and nothing else), then a similar reversal should be noted at MW-2. Since this effect is not observed, it suggests that something else is controlling the reversal.

The following three points may help explain the anomaly:

i) From Table 3-2, the following changes in groundwater height over the tidal cycle were noted:

Well	Change in water elevation (high minus low tide)
MW-2S	0.89 ft
MW-2D	1. 41 ft
MW-11S	-0.02 ft
MW-11R	0. 94 ft

Thus the wells at MW-2 seem to show a greater tidal effect than those at MW-11; the real reason the vertical gradient reverses at MW-11 is that MW-11S shows no tidal effect. Since MW-11S does not vary with the tides, as groundwater levels go up and down at MW-11R, the gradient reverses.

ii) the average seasonal variation in the water table (as compiled from data in Table 3-2) for all wells but MW-11S is 1.31 ft; MW-11S only varies by 0.26 ft (MW-11R for comparison varies by 0. 96 ft). Thus MW-11S not only shows little tidal effect, but also little seasonal effect.

iii) MW-11S is the only well on site not screened in overburden or bedrock but in fill.

All the above suggests that there is something anomalous about MW-11S in that it shows no tidal effects or seasonal effects, and that this anomaly may be the cause of the gradient reversal, not the tides.

As the Navy has stated, any future omission of groundwater elevation data will be noted on figures and discussed in the text.

Response: As is presented in the draft final RI report, the vertical gradient variations at well nest MW-11 appear to be related to the observed seasonal and tidal changes in the piezometric water levels in each of the wells. In addition, consistently positive gradients were observed at well nest MW-2. These differences are likely the result of several factors including the well's location relative to the bay, the screened depth of the wells, and the geologic and hydrogeologic characteristics (e.g., porosity, hydraulic conductivity) of the screened formations. As is presented on page 3-24 of the report, a noticeable vertical gradient reversal was observed at well nest MW-11. Also presented in the report are the observed tidal effects in MW-11R and seasonal effects in MW-11S. The following additional discussion will be added to this discussion in the final report (page 3-24) regarding the different vertical gradients observed at wells nests MW-2 and MW-11.

"The gradient difference observed between the well nest locations are likely the result of several factors including the well's location relative to the bay, the screened depth of the wells, and the geologic and hydrogeologic characteristics (e.g., porosity, hydraulic conductivity) of the screened formations. With respect to well nests MW-2 and MW-11, the differences in these factors which likely account for the differences observed at each well location are as follow: MW-2S is approximately 15 feet from the shoreline and MW-11S is approximately 30 feet from the shoreline; the MW-2S screen bottom (10-foot screen) is on average approximately 8 feet below the water table and the well MW-11S screen bottom (5-foot screen) is on average approximately 4 feet below the water table; well MW-11R is screened at a mid-screen depth (5-foot screen) of approximately 11 feet below mlw and well MW-2D is screened at a mid-screen depth (10-foot screen) of approximately 16 feet below mlw; well MW-11S is screened in highly conductive, porous fill material and well MW-2S is screened in a less conductive sand and silt; and well MW-11R is screened in a conductive weathered shale and MW-2D is screened in a denser slightly less conductive soil. Thus, based on the above considerations, more significant water level fluctuations are observed in the wells which are deeper (MW-2S and MW-2D), closest to the shoreline (MW-2S), and screened in significantly less conductive materials (MW-2S). As presented in a paper on the tidal effects on a coastal aquifer (Erskine, 1991), the deeper wells show the greatest tidal influence because the tidal pressure waves are quicker and less dampened in the deeper formation as a consequence of a more confined-like storage conditions of the deeper formation. Whereas, this paper also reported that at or near the phreatic surface or ground water table the pressure waves tend to be inhibited and dampened because of the relatively much larger unconfined aquifer storage at the surface. It is also likely that the area of highly conductive surface fill materials (high transmissivity) in which well MW-11S is screened resulted in a further dampening of any seasonal recharge effects to this formation and the

observed lack of any seasonal ground water elevation variations in this well (i.e., as compared to MW-2S)."

20. The use of the term "contaminant-comparison" implies a risk-based genesis and a federal/state acceptance, neither of which is true in this instance.

Replace the term "contaminant-comparison" level for the analytical soil data with another term (i.e., hypothetical threshold) for comparison of ΣVOCs, ΣSVOCs,ΣPAHs andΣPAH (carcinogenics) as appropriate. If as stated in the Navy's response, these are only to be used as general indicators of the degree of soil contamination, then their degree of usefulness will not be altered by changing the term used to refer to them.

Response: It is the Navy's contention that the use of the term "contaminant comparison level" in no way implies "a risk-based genesis or federal/state acceptance". The purpose of the contaminant comparison levels are clearly presented in the RI report and as stated in the report and previous comment responses these levels are not risk-based levels. In addition, the Navy has never claimed that the levels are in any way accepted regulatory criteria, guidance, or action levels. Furthermore, the Navy believes that the suggested replacement term, "hypothetical threshold", by definition and inference implies something much more definitive and regulatory based. Given the current use of the term "threshold" in risk assessment and industrial hygiene practices, it is believed that this term is more likely to imply a risk-based or federal/state acceptance. In addition, the term "hypothetical" by definition would imply that a more definitive hypothesis or tentative assumption was made in order to draw out and test its logical or empirical consequences with respect to the levels. Thus, the use of either of the suggested words for these levels is more likely to result in a misinterpretation of their intended use. Therefore, given that these values are solely used for comparing contaminant levels between samples, the Navy believes that the self-explanatory, non-scientific term "contaminant comparison" is the most appropriate term. However, to eliminate any confusion over whether these levels are established action "levels" the word level will be changed to "value" in the use of this term and page 4-4 of the report will be revised to state that the "contaminant-comparison values are not based on federal or state acceptance levels". Furthermore, the Navy believes that it has not misrepresented the use of this term or these levels in this or any other RI reports.

21.The Navy responds it does not feel it is necessary to remove statements like "very low levels" because " these statements provide general indications of the level of contaminant classes detected...", indicating a need for a qualitative description of contamination of the site. This statement contradicts the approach stated on p. 4-3 (addressed in comment 20 above), in which the Navy argues that it needs to use its own established "contaminant-comparison" levels in order to present quantitative descriptions of contamination.

The problem with using statements like "very low levels" is that something is always left unstated. Are these very low levels with respect to:
- previous samples collected at this location; or
- other samples at this location; or
- other locations at the site; or
- other sites; or
- elsewhere within the State of Rhode Island; or
- unreferenced data on background samples.

Either delete these vague references or further explain these statements.

Response: The inclusion of terms such as "low levels" in the report does not contradict the use of "contaminant comparison levels" for evaluating contaminant levels between samples. Given the relative absence of any regulatory soil clean-up or action levels, both approaches provide a means for evaluating "relative" soil contamination levels by identifying locations where significant contamination may exist. Thus, both data assessment methods have been discussed in the report as interpretive qualitative indicators of the relative levels of contaminants detected in the site samples. It is the Navy's belief that these indicators are appropriately presented so as to aid the general public in understanding the contaminant levels presented in the report. However, in response to the EPA's continued comment on this issue, the words "low levels" will either be eliminated or clarified (e.g., parts per billion) in the contamination assessment in the final RI report. In a similar fashion, similar uses of the descriptive words "elevated" and "high" will also be reassessed throughout the contamination assessment.

24.See discussion of the Navy's response to comment #20.

Response: See response to EPA comment #20.

25.A substitution of chloroethane for chloroform was made in the text; however, the remainder of the paragraph discusses the above detection as probably due to laboratory contamination.

While chloroform is a common laboratory contamination, chloroethane is not.

Revise the text to discuss the chloroethane contamination.

Response: The reference to chloroethane as a solvent will be deleted from the text. The following statement will instead be added in reference to the detected chloroethane: "Chloroethane was detected in one of the subsurface samples at a concentration of 1 ppb.".

29.See discussion of the Navy's response to comment #20.

Response: See response to EPA comment #20.

35.The text was not revised to indicate that the summary of MCL exceedances was abbreviated; instead it states that a more complete discussion can be found elsewhere. Revise text as previously requested.

Response: The referenced Section 5.0 ground water inorganics summary recognizes that inorganic MCLs or SMCLs were exceeded in "each of the wells". Also highlighted are the background inorganic exceedances (@ MW-5 and MW-6) and the on-site well having the highest overall inorganic contamination (MW-9R). However, to clarify that this discussion is a summary of the inorganic MCL exceedances, the last sentence of this discussion will be rewritten as follows: "The above discussion presents an abbreviated summary of inorganic MCL exceedances, a more complete discussion of the Phase I and Phase II ground water sample inorganic analysis results is presented in Section 4.2 and summarized in Tables 4-14 and 4-15.".

ATTACHMENT B

DRAFT FINAL HUMAN HEALTH RISK ASSESSMENT REPORT

Response to Comments

The following responses to EPA comments do not appear to have been incorporated and/or require additional documentation as noted below. The response number is the number associated with the original EPA comment; see EPA's letter dated May 25, 1994:

11. The Navy's response to comments indicates that the text and tables will be revised to define surface soil and subsurface soil as 0 to 1 foot below grade and deeper than 1 foot below grade, respectively. In the draft final Phase II RI report, it now states on page 2-3 that no Phase I subsurface soils samples were obtained from the 1- to 2-foot interval below grade, and on page 2-5 that no Phase II subsurface soil samples were obtained from the 1- to 1.5- foot interval below grade.

Discuss these gaps in the data and the implications to the risk assessment in Section 7.1, Uncertainties Related to the Hazard Identification.

Response: The text (pages 2-3 and 2-5) and tables (Table 2-1) were revised to define surface soil and subsurface soil as < or = 1 foot below grade and subsurface soil as > 1 foot below grade. In addition, the referenced statements on the depths at which subsurface soil samples were not collected was added to the revised report. However, these additional statements are misleading and will be deleted from the final report. Although samples were collected from these other depths (1 - 2 ft. and 1 -

1.5 ft) they were not submitted for laboratory analysis according to the sampling plan. According to the sampling plan, subsurface soil samples were typically collected from the last interval above the ground water table and at those locations where potential contamination (e.g., stains, odors) were observed above the water table. Thus, although subsurface soil/fill samples were not collected for analysis from <u>every</u> sample interval, representative samples of the subsurface media are believed to have been collected and this is not considered a significant "data gap". Furthermore, the number of samples analyzed and the sample locations are already discussed as uncertainties on page 7-1 of the uncertainty analysis.

19. Risks were not calculated for chromium (assuming that the concentrations reported as total chromium are entirely chromium VI). In addition, the Navy does not provide further rationale for using the 0.14 ratio of chromium VI to chromium III.

The revised text states that "Although a variety of factors affect the ratio of trivalent to hexavalent chromium (e.g., soil type and characteristics), this information is not provided in Bagdon and Hazen (1991) and is not available for Site 09". This statement adds to the questionability of the application of this ratio to Naval Education and Training Center.

Confirm if the total chromium concentrations reported are chromium VI, calculate risks for chromium, and provide the rationale for using the above-referenced ratio (0.14) of chromium VI to chromium III.

<u>Response</u>: Risks assuming that total chromium concentrations consist entirely of hexavalent chromium were calculated in the draft final report. A statement on the calculation of these risks is provided on page 5-5 of the report and the risk calculations are provided on the bottom of the tables in Appendix F of the report. However, since the risks determined under this assumption were not significant, they were not highlighted or discussed further. Given the absence of any site-specific data on the speciation of chromium and the unavailability of any other sources of typical chromium speciation information, the referenced ratio was used as one approach to estimate the risks associated with the detected chromium levels.